

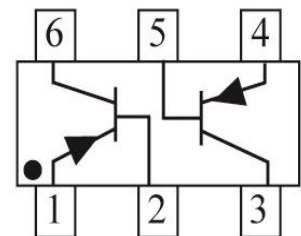
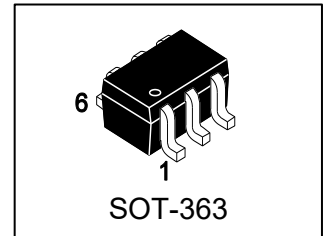
# MBT3906D

## S-MBT3906D

Dual General Purpose Transistors PNP Silicon

### 1. FEATURES

- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.
- Low  $V_{CE(sat)}$ ,  $\leq 0.4 V$
- Simplifies circuit design
- Reduces board space
- Reduces component count
- $h_{FE}$ , 100–300



### 2. DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
MBT3906D	A2	3000/Tape&Reel

### 3. MAXIMUM RATINGS( $T_a = 25^\circ C$ )

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	$V_{CEO}$	-40	Vdc
Collector–Base Voltage	$V_{CBO}$	-40	Vdc
Emitter–Base Voltage	$V_{EBO}$	-5	Vdc
Collector Current — Continuous	$I_C$	-200	mAdc

### 4. THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation, FR-5 Board (Note 1) @ $T_A = 25^\circ C$ Derate above $25^\circ C$	PD	150 1.2	mW mW/ $^\circ C$
Thermal Resistance, Junction–to–Ambient(Note 1)	$R_{\theta JA}$	833	$^\circ C/W$
Junction and Storage temperature	$T_J, T_{stg}$	-55~+150	$^\circ C$

1. FR-5 = 1.0×0.75×0.062 in.



**5. ELECTRICAL CHARACTERISTICS (Ta= 25°C )**
**OFF CHARACTERISTICS**

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = -1.0 mAdc, IB = 0)	VBR(CEO)	-40	-	-	V
Collector–Base Breakdown Voltage (IC = -10 µAdc, IE = 0)	VBR(CBO)	-40	-	-	V
Emitter–Base Breakdown Voltage (IE = -10 µAdc, IC = 0)	VBR(EBO)	-5	-	-	V
Collector Cutoff Current ( VCE = -30 Vdc, VEB = -3.0Vdc)	ICEX	-	-	-50	nA
Base Cutoff Current (VCE = -30 Vdc, VEB = -3.0Vdc)	IBL	-	-	-50	nA

**ON CHARACTERISTICS (Note 2.)**

DC Current Gain (IC = -0.1 mAdc, VCE = -1.0 Vdc)	HFE	60	-	-	
(IC = -1.0 mAdc, VCE = -1.0 Vdc)		80	-	-	
(IC = -10 mAdc, VCE = -1.0 Vdc)		100	-	300	
(IC = -50 mAdc, VCE = -1.0 Vdc)		60	-	-	
(IC = -100 mAdc, VCE = -1.0 Vdc)		30	-	-	
Collector–Emitter Saturation Voltage (IC = -10 mAdc, IB = -1.0 mAdc)	VCE(sat)	-	-	-0.25	V
(IC = -50 mAdc, IB = -5.0 mAdc)		-	-	-0.4	
Base–Emitter Saturation Voltage (IC = -10 mAdc, IB = -1.0 mAdc)	VBE(sat)	-0.65	-	-0.85	V
(IC = -50 mAdc, IB = -5.0 mAdc)		-	-	-0.95	

**SMALL–SIGNAL CHARACTERISTICS**

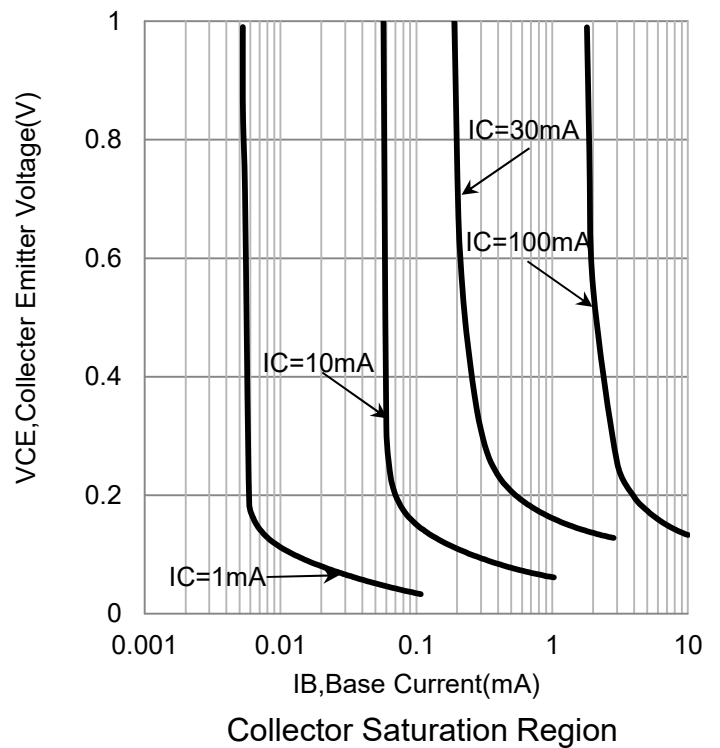
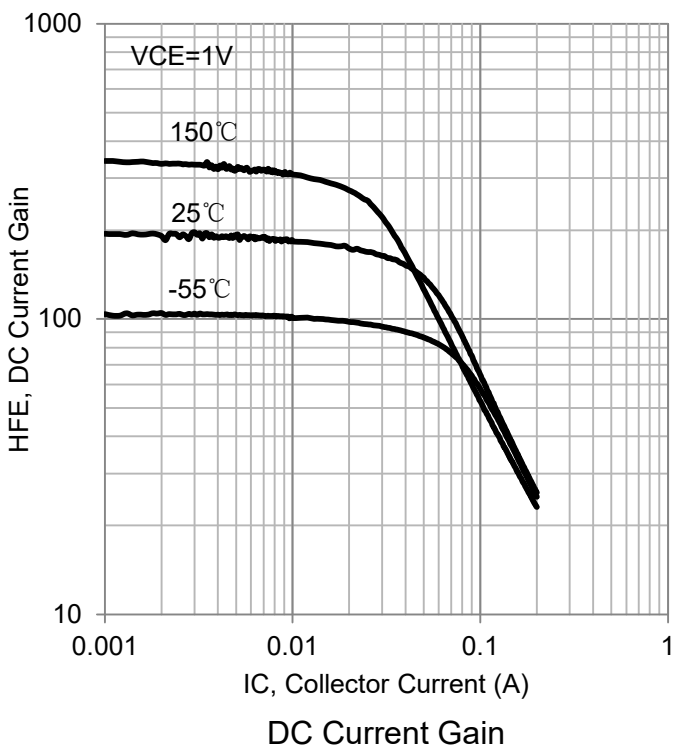
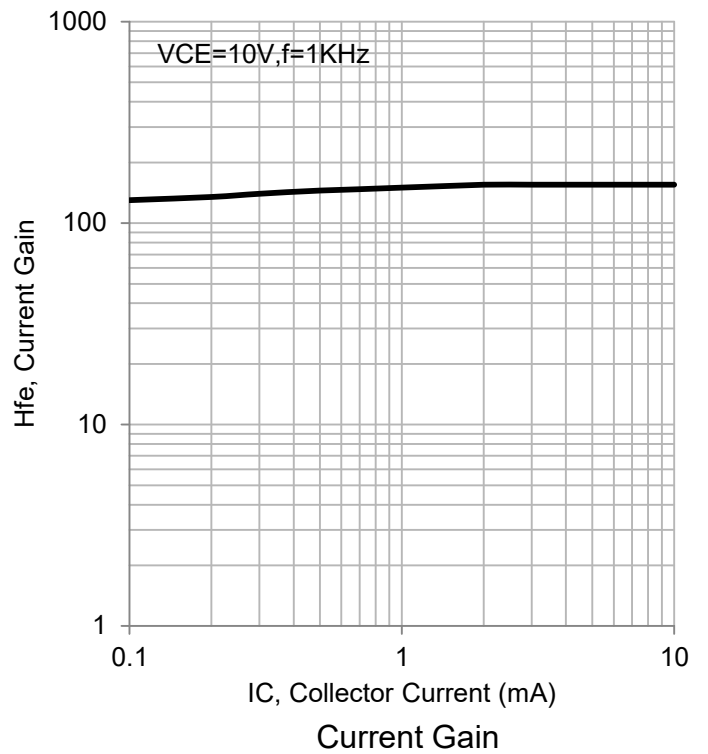
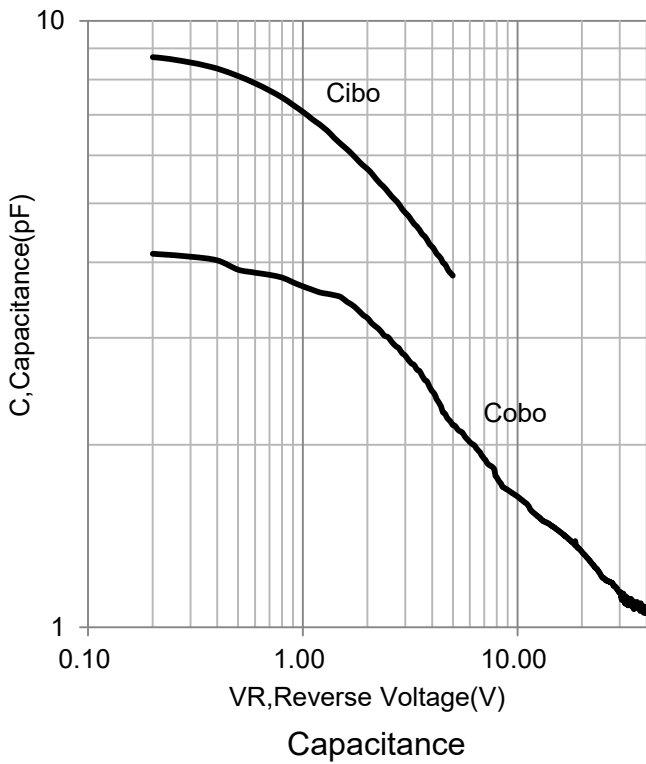
Current–Gain — Bandwidth Product (IC = -10mAdc, VCE= -20Vdc, f = 100MHz)	fT	250	-	-	MHz
Output Capacitance (VCB = -5.0 Vdc, IE = 0, f = 1.0 MHz)	Cobo	-	-	4.5	pF
Input Capacitance (VEB = -0.5 Vdc, IC = 0, f = 1.0 MHz)	Cibo	-	-	10	pF

**SWITCHING CHARACTERISTICS**

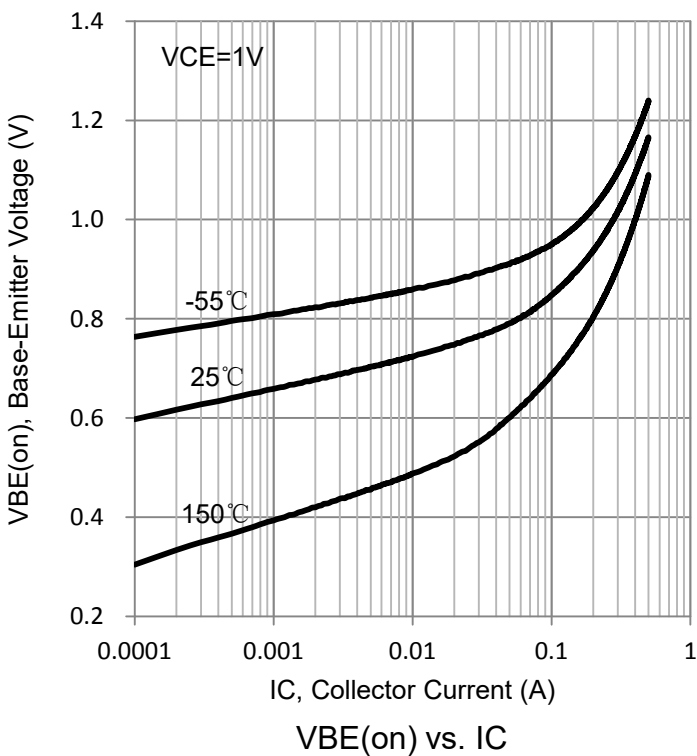
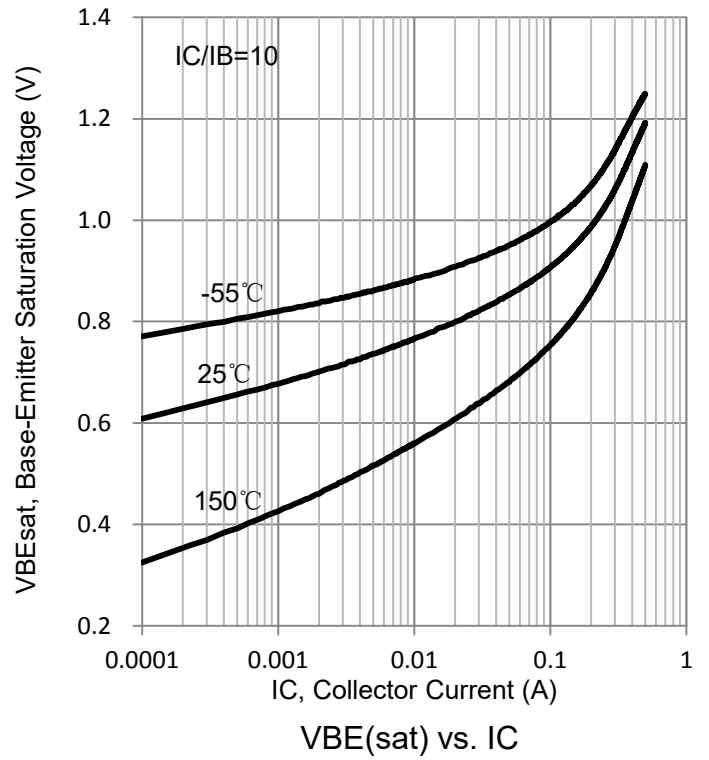
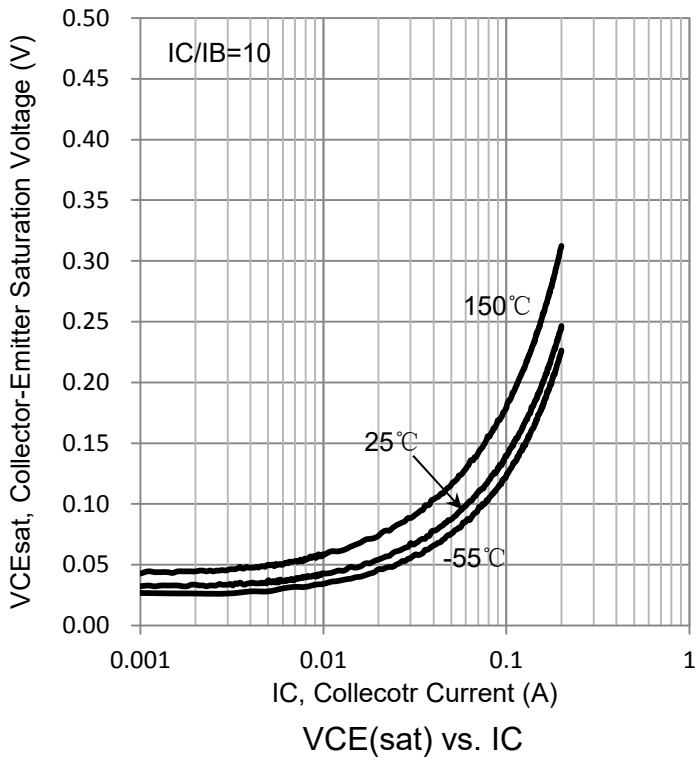
Delay Time	(VCC = -3.0 Vdc, VBE=0.5Vdc, IC = -10mAdc, IB1 = -1.0 mAdc)	td	-	-	35	ns
Rise Time		tr	-	-	35	
Storage Time		ts	-	-	225	
Fall Time		tf	-	-	75	

 2.Pulse Test: Pulse Width  $\leq 300 \mu s$ , Duty Cycle  $\leq 2.0\%$ .


**6. ELECTRICAL CHARACTERISTICS CURVES**



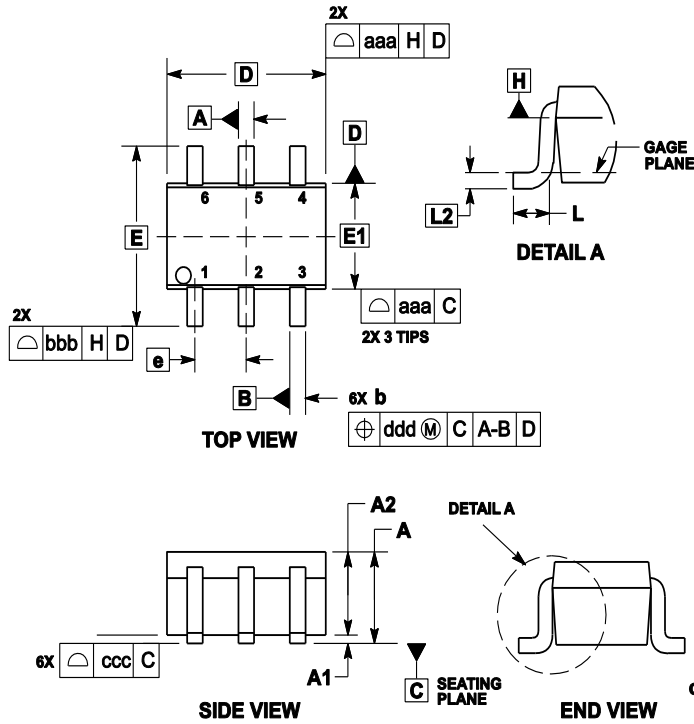
**6. ELECTRICAL CHARACTERISTICS CURVES(Con.)**



**7. OUTLINE AND DIMENSIONS**

Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.00	---	0.10	0	---	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.01
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.07	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.01		
bbb	0.30			0.01		
ccc	0.10			0.00		
ddd	0.10			0.00		

**8. SOLDERING FOOTPRINT**
